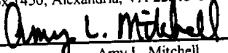


**Apparatus and method to net food products in shirred tubular casing**

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10 **BACKGROUND OF THE INVENTION**

This invention relates to the field of preparing food products in shirred, tubular casings and enclosing the products in netting. As used in this specification, the term "shir" refers to the process of gather a continuous tube of casing material over a tube or horn. The term "ruck" means to shir netting over a tube or horn. Traditionally, meat products were wrapped in netting prior to processing. Removal of the netting after processing, whether it be cooking smoking, curing, aging, or otherwise, often resulted in some of the meat products sticking to the netting and being pulled off during the removal process, leaving an unsightly appearance unpleasant to consumers. Later, the use of edible collagen films solved this problem. Meat products, including sausages and whole-muscle products, are now conventionally enveloped into a tubular shape in an edible collagen film. In the prior art, flat sheets of collagen film are turned over plows to form a sausage casing. The casing is then wrapped in a net and the product is further processed, such as cooking, aging, or smoking. After processing, the netting is removed easily, as it does not stick to the collagen film. Various collagen films can be used, including flavored and colored films, to create various taste sensations or appearances.

The use of flat sheets of collagen films requires the use of complicated plows and guides, as noted in United States Patent No. 4,958,477 to Winkler. The use of such an arrangement requires extended set up time and diligent supervision during operation. This method also produces quite a bit of overlap of film and allows food product to leak at the seams if insufficient overlap is not present. Accordingly, this method inefficiently wastes film.

5 The use of netting provides a mesh appearance on the surface of the food products. Having a dimpled appearance, however, is considered more appealing to consumers.

10 Accordingly, a need exists for a simpler, more efficient, easier way to encase food products in collagen film, requiring less set up time, less supervision, and producing a highly-dimpled end product. The present invention fills this need.

#### BRIEF SUMMARY OF THE INVENTION

15 The present invention include the use of tubular shirred casing, rather than sheets of casing film, and the extrusion of the food products into a casing of smaller diameter than the netting, which will cause the netting to constrict around the casing, leaving a dimpled appearance. Food products, either sausages or whole-muscle meats, are extruded through a tube or horn into a shir housing on which a tubular edible collagen film has been shirred. The shir housing is coaxial to 20 a netting tube on which netting, of smaller diameter than that of the collagen film, has been shirred. As the food products exit the shir housing, they expand the collagen film, pushing that tubular film outwards and against the netting. Since the collagen film is of a larger diameter than

the netting, the pressure of the food products against the collagen film creates a dimpled appearance in that film.

It is an object of this invention to create an apparatus and method of packing food products in a tubular edible collagen film, rather than wrapping the food products in cylindrical form in flat sheets of collagen film. It is a further object of this invention to package the food products in a tubular collagen film of a smaller diameter than the netting, in order to emphasize the dimpled appearance of the products. Although the invention will be described for the use of sausage, it can be used for any product, including whole-muscle meats, cheeses, vegetarian sausage, or any other product in which a dimpled appearance is desired.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an elevation view of the apparatus of the present invention.

Figure 2 is an elevation view of the apparatus of the present invention showing the film shirred thereon.

Figure 3 is an elevation view of the apparatus of the present invention showing the netting rucked thereon.

Figure 4 is a flow diagram of the method of the present invention.

#### 20 BRIEF SUMMARY OF THE INVENTION

The organization and manner of the method of the preferred embodiments of the invention, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the drawings.

The apparatus 2 comprises a shir housing 10, a netting tube 20, and a filling horn 30, as shown in Figure 1. The filling horn 30 is a long tube that releasably attaches to and protrudes horizontally from a standard food preparation apparatus, not pictured, such as a conventional sausage-making machine. 5 Tubular edible collagen film 40 is shirred onto the filling horn 30 prior to use. Figure 2 illustrates the filling horn 30 with the film 40 shirred onto the filling horn 30.

The shir housing 10 comprises a tube 11 of larger diameter than that of the filling horn 30 and a back plate 16. In the preferred embodiment, the shir housing 10 has a seven-inch diameter while 10 the filling horn 30 has a three-inch diameter. The tube of the shir housing 10 is welded at its upstream end 12 to a back plate 16. The back plate 16 attaches to the sausage-making machine and contains an aperture 18 through which the filling horn 30 extends. Accordingly, the filling horn 30 is coaxial to and inside of the shir housing 10. The filling horn 30 can either sit snugly 15 within the aperture 18, or can be sealed with a suitable gasket, or can be welded directly to the back plate 16.

The netting tube 20 comprises an elongated tube 21 welded to a transition plate 22 at its upstream end 24. The netting tube 20 holds netting 50 in a conventional way, such as outer tube 24 as described in United States Patent No. 4,958,477. The netting tube 20 of the present 20 invention, however, unlike the outer tube of the '477 patent, attaches to the shir housing 10. Preferably, Quick Locks® are used, but any convenient means of attachment will suffice, such as bayonet pins, locking pins, threaded fasteners, interference fit, or anything else that attaches the transition plate 22 of the netting tube 20 to the shir housing 10. The netting 50 of the present

invention is of a smaller diameter than the diameter of the tubular film 40. Figure 3 illustrates the apparatus 2 with netting 50 rucked onto the netting tube 20.

Please note that the netting tube 20 is of an intermediate diameter to that of the shir housing 10 5 and the filling horn 30. In the preferred embodiment, the netting tube has a diameter of four inches.

A break ring 60 can be placed on the downstream end 26 of the netting tube 20, to rectify the 10 release of netting 50 from the netting tube. Preferably, however, a derucking rectifier is used in order to obtain sausages of consistent length.

In use, therefore, the filling horn 30 protrudes from the sausage-making machine and has a 15 length of tubular edible collagen film 40 shirred onto it. The film 40 is protected by the shir housing 10 which releasably attaches to the netting tube 20 near the upstream end 24 of the netting tube 20. The netting tube 20 extends downstream from the shir housing 10 and holds the netting 50 in place. A conventional clipper 60 is located at the downstream end 34 of the filling horn 30.

The method of the present invention is illustrated in block diagram form in Figure 4. In use, the 20 tubular film 40 is shirred onto the filling horn 30 and past the downstream end 32 of the filling horn 30. The netting tube 20, with netting 50 rucked onto it, is locked in place to the shir housing 10 and over the filling horn 30, using means 28. The end of the netting 50 and the end of the film 40 are clipped in a conventional manner by the clipper 60. This clip will become one

end of the first sausage made by the apparatus 2. (Please note, however, that the first sausage is likely to contain quite a bit of air. It is recommended to bleed as much air out of the system as possible before applying the first clip.)

- 5 The sausage meat, having been made in the sausage-making machine, is extruded under pressure in a conventional manner into the upstream end 32 of the filling horn 30. As the sausage meat progresses down the filling horn 30, it pushes the tubular film 40 off the filling horn 30 and out the downstream end of the apparatus 2. As the film 40 is pushed off the filling horn 30, it expands outward against the netting 50. Since the netting 50 is of a smaller diameter than that of
- 10 the film 40, the film 40 will bulge through the spaces in the netting 50, creating the dimpled appearance that is an object of the invention.

After a sufficient length of sausage has been extruded, the clipper 60 squeezes the netting 50 and film 40, applies two clips, and severs the sausage in a conventional manner. The sausage is now

15 ready for further processing. The process continues as set forth above.

While preferred embodiments of the present invention are shown and described, it is envisioned that those skilled in the art may devise modifications of the present invention without departing from the spirit and scope of the appended claims.